CLAIMS

1. A light-emitting device comprising:

a first layer containing a light-emitting material;

a second layer containing an N-type semiconductor;

a third layer including a transparent conductive film; and

a fourth layer containing a hole-transporting material;

wherein the first layer, the second layer, the third layer, and the fourth layer are sandwiched between an anode and a cathode,

wherein the first layer, the second layer, the third layer, the fourth layer, and the cathode are provided in order, and

wherein the cathode has a layer containing reflective metal.

2. A light-emitting device comprising:

a first layer containing a light-emitting material;

a second layer containing an N-type semiconductor;

a third layer including a transparent conductive film; and

a fourth layer containing a hole transporting material;

wherein the first layer, the second layer, the third layer, and the fourth layer are sandwiched between an anode and a cathode, and

wherein the first layer, the second layer, the third layer, the fourth layer, and the cathode are provided in order.

3. The light-emitting device according to Claim 1 or 2,

wherein the reflective metal comprises aluminum, silver, alloy containing aluminum, or alloy containing silver.

4. The light-emitting device according to Claim 1 or 2,

wherein the transparent conductive film comprises at least one material selected from the group consisting of indium tin oxide, indium tin oxide containing silicon, and indium oxide containing zinc oxide by 2 to 20%.

5. The light-emitting device according to Claim 1 or 2,

wherein the N-type semiconductor contained in the second layer comprises metal oxide.

6. The light-emitting device according to Claim 1 or 2,

wherein the N-type semiconductor contained in the second layer comprises at least one material selected from the group consisting of zinc oxide, tin oxide, and titanium oxide, a compound containing two or more of zinc oxide, tin oxide, and titanium oxide.

7. The light-emitting device according to Claim 1 or 2,

wherein the hole transporting material contained in the fourth layer comprises a hole-transporting material containing an inorganic compound.

8. The light-emitting device according to Claim 7,

wherein the hole-transporting material containing the inorganic compound

comprises a P-type semiconductor.

9. The light-emitting device according to Claim 8,

wherein the P-type semiconductor is one selected from the group consisting vanadium oxide, chromium oxide, molybdenum oxide, cobalt oxide, and nickel oxide, a compound containing two or more of vanadium oxide, chromium oxide, molybdenum oxide, cobalt oxide, and nickel oxide.

10. The light-emitting device according to Claim 1 or 2,

wherein the hole transporting material contained in the fourth layer comprises a hole-transporting material containing an organic compound.

11. The light-emitting device according to Claim 10,

wherein the hole-transporting material comprises an organic compound having an aromatic amine skeleton.

12. The light-emitting device according to Claim 1 or 2,

wherein the hole transporting material contained in the fourth layer comprises a material doped with a material having electron-receiving properties to an organic compound.

13. The light-emitting device according to Claim 12,

wherein the material having electron-receiving properties comprises metal oxide.

14. The light-emitting device according to Claim 12,

wherein the material having electron-receiving properties comprises at least one material selected from the group consisting of molybdenum oxide, vanadium oxide, rhenium oxide, and a compound containing two or more of molybdenum oxide, vanadium oxide, and rhenium oxide.

15. A light-emitting device comprising:

a first layer containing a light-emitting material;

a second layer containing an organic compound and an electron-supplying material;

a third layer including a transparent conductive film; and

a fourth layer containing a hole transporting material;

wherein the first layer, the second layer, the third layer, and the fourth layer are sandwiched between an anode and a cathode,

wherein the first layer, the second layer, the third layer, the fourth layer, and the cathode are provided in order, and

wherein the cathode has a layer containing reflective metal.

16. A light-emitting device comprising:

a first layer containing a light-emitting material;

a second layer containing an organic compound and an electron-supplying material;

a third layer including a transparent conductive film; and

a fourth layer containing a hole transporting material;

wherein the first layer, the second layer, the third layer, and the fourth layer are sandwiched between an anode and a cathode, and

wherein the first layer, the second layer, the third layer, the fourth layer, and the cathode are provided in order.

17. The light-emitting device according to Claim 15 or 16,

wherein the reflective metal comprises at least one material selected from the group consisting of aluminum, silver, alloy containing aluminum, or alloy containing silver.

18. The light-emitting device according to Claim 15 or 16,

wherein the transparent conductive film at least one material selected from the group consisting of indium tin oxide, indium tin oxide containing silicon, and indium oxide containing zinc oxide by 2 to 20%.

19. The light-emitting device according to Claim 15 or 16,

wherein the organic compound contained in the second layer comprises an organic compound having electron-transporting properties.

20. The light-emitting device according to Claim 15 or 16,

wherein the organic compound contained in the second layer comprises a metal complex having a ligand including a π-conjugated skeleton.

21. The light-emitting device according to Claim 15 or 16,

wherein the electron-supplying material comprises at least one material selected from the group consisting of alkali metal, alkali-earth metal, and rare-earth metal.

22. The light-emitting device according to Claim 15 or 16,

wherein the electron-supplying material comprises at least one material selected from the group consisting of Li, Cs, Mg, Ca, Ba, Er, and Yb.

23. The light-emitting device according to Claim 15 or 16,

wherein the hole transporting material contained in the fourth layer comprises an inorganic compound.

24. The light-emitting device according to Claim 23,

wherein the hole-transporting material containing the inorganic compound comprises a P-type semiconductor.

25. The light-emitting device according to Claim 24,

wherein the P-type semiconductor comprises at least one material selected from the group consisting of vanadium oxide, chromium oxide, molybdenum oxide, cobalt oxide, nickel oxide, and a compound containing two or more of vanadium oxide, chromium oxide, molybdenum oxide, cobalt oxide, and nickel oxide.

26. The light-emitting device according to Claims 15 or 16,

wherein the hole transporting material contained in the fourth layer comprises an organic compound.

27. The light-emitting device according to Claim 26,

wherein the hole-transporting material is an organic compound having an aromatic amine skeleton.

28. The light-emitting device according to Claims 15 or 16,

wherein the hole transporting material contained in the fourth layer comprises a material doped with a material having electron-receiving properties to an organic compound.

29. The light-emitting device according to Claim 28,

wherein the material having electron-receiving properties comprises metal oxide.

30. The light-emitting device according to Claim 28,

wherein the material having electron-receiving properties comoprises at least one material selected from the group consisting of molybdenum oxide, vanadium oxide, rhenium oxide, and a compound containing two or more of molybdenum oxide, vanadium oxide, and rhenium oxide.

31. An electronic device comprising a light emitting device according to any one of claims 1, 2, 15 and 16, wherein the electronic device is one selected from the group

consisting of a television receiving machine, a personal computer, head mount display, a mobile phone and a video camera.